

Plant Science



A place to grow. That's how some of the nation's most prestigious plant science companies view Missouri. As a hub to agricultural organizations and home to numerous incubators and research parks, Missouri provides a fertile environment for those working to bring new products to market. And Missouri's low business costs and easy access to investors help yield healthier companies.



"Missouri's commitment to scientific advancement and large, turn-key labor pool have helped make it the top destination for plant science facility development. In addition to being home to some of the most prestigious bioscience companies in the world—including Monsanto and Sigma-Aldrich—Missouri boasts a low-cost business climate and easy access to research and commercialization facilities that plant science companies need to thrive."

— Governor Jeremiah W. "Jay" Nixon

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Missouri's pro-business rankings:

3rd lowest business costs, including employee wages (*CNBC*, 2011)

8th most pro-business state (*Pollina Corporate Real Estate*, 2011)

In the top 10 of the U.S. for tax rankings:

Top 10 for property tax index

Top 10 for corporate income tax index

Top 10 for unemployment insurance tax index (*Tax Foundation*, 2012)



Missouri's Top Advantages for the Plant Sciences Industry

Missouri has the right workforce to sustain plant science companies.

- Over **50,000** Missourians are employed in **3,433** bioscience-related firms (*U.S. Bureau of Labor Statistics, 2011*).
- **86.2%** of Missouri's population has attained a high school diploma or higher, exceeding the national average of **85%**.
- Over **1.4 million** Missourians hold a bachelor's degree or higher (*U.S. Census Bureau, American Community Survey*).

Missouri has long been recognized for having the right business environment for plant science companies.

- Missouri has the **3rd** lowest business costs in the U.S. (*CNBC, 2011*).
- Missouri is home to the world's leading technology company focused on agriculture—Monsanto.



- Missouri is a hub for leading agricultural associations, including the National Corn Growers Association, the American Soybean Association, and the National Center for Soybean Biotechnology.

Missouri's research centers, incubator facilities, and educational institutions support plant science companies in bringing their discoveries from the laboratory to market.

- Missouri has **14** specialized plant science incubators and research centers spread throughout the state.
- The Whitney R. Harris World Ecology Center—a cooperative project of University of Missouri-St. Louis and Missouri Botanical Garden—has grown over the past 20 years into one of the world's preeminent centers for education and research in tropical biology.
- The University of Missouri is one of only a few universities in the United States with schools of medicine, agriculture, and veterinary medicine on one campus.

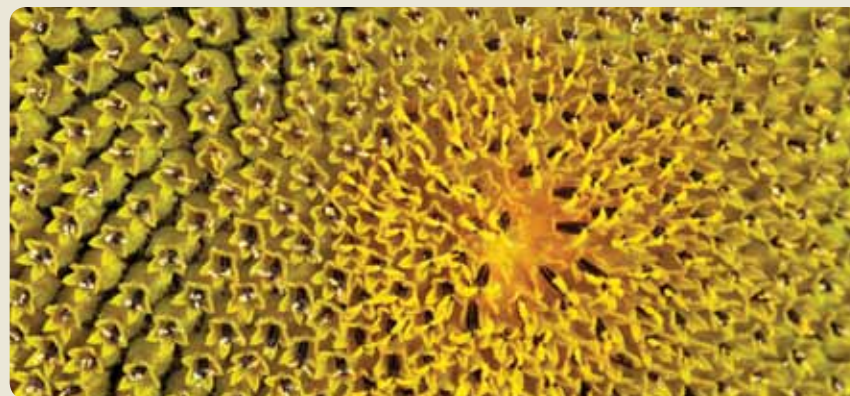
- St. Louis is the only region in the country to win both the i6 Challenge Grant and the Jobs and Innovation Accelerator Challenge. These grants—worth **\$1 million** and **\$1.8 million**, respectively—support science-based entrepreneurship and high-growth industry clusters. The i6 Challenge Grant alone has resulted in **8** new bioscience companies.

Missouri's top ranked transportation network is a dependable delivery system for goods and services.

- Missouri has the **7th** largest highway system and one of the best and least congested transportation networks in the United States.
- **2** of the largest rail terminals in the U.S. are located in Missouri, and the state provides rail access to both East and West coasts.
- Missouri has access to the northernmost ice-free ports and the southernmost lock and dam on the Mississippi river.
- Missouri has **2** international airports: Kansas City International and Lambert-St. Louis International.

Did you know?

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Major Plant Science Companies in Missouri

■ **Bayer CropScience's Core Technologies**

Center (Kansas City) oversees manufacturing, formulation operations, and R&D activities for its parent company. Bayer CropScience was created by Bayer AG's acquisition of Aventis CropScience in 2001. The Kansas City facility serves as its U.S. sales office.

- **Bunge North America** (HQ St. Louis) is a leading exporter and domestic supplier of soybeans, corn, wheat, sorghum, canola, and rice in the United States. The company also produces edible oils and shortenings, dry corn milling, animal feed, breakfast cereals, snack foods, and breads.

- **Monsanto** (HQ St. Louis) is a Fortune 500 company that helps farmers grow more crops by applying biotechnology and genomics to seeds and herbicides. In addition to producing the world's top herbicide (Roundup), the company also produces seeds which are resistant to Roundup. Monsanto recently acquired Divergence, a St. Louis research company that develops genes and molecules for the control of nematodes.

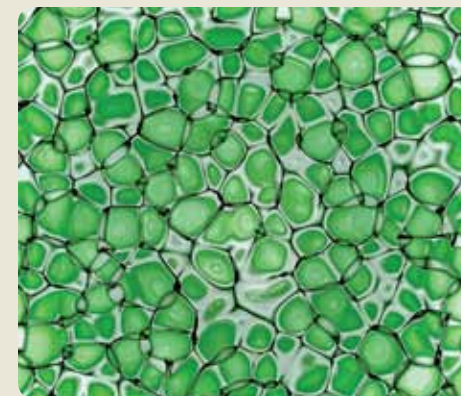
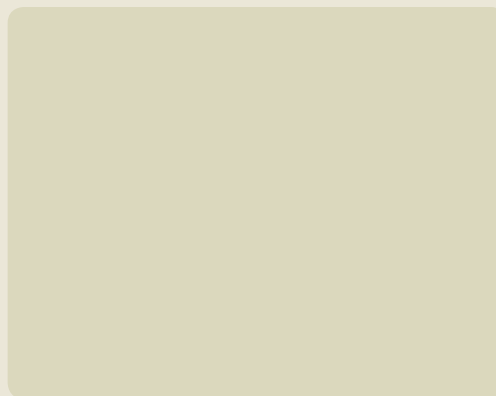
- **Pioneer Hi-Bred** (New Madrid) opened a \$60 million soybean production plant in 2011 to serve soybean growers in southern United States. The plant, which employs more than 65 people, joins the company's research facility in Miami, Missouri, which sells corn, soybeans, sorghum, and wheat seed throughout the state.

- **Sigma-Aldrich** (HQ St. Louis) produces chemical and biochemical products for scientific research, biotechnology, pharmaceutical development, and the diagnosis of disease. The company's products are also used as key components in high technology manufacturing.

- **The Solae Co.** (HQ St. Louis) was formed as a joint venture between DuPont and Bunge in 2003 to develop, produce, and market soy-based food ingredients. With more than 3,500 customers in 80 countries across the globe, the company manufactures soy protein for beverages and meatless foods as well as soy-based polymers for use in the paper industry.

- **SyMyCo** (St. Louis), an international bioscience company, recently announced its new location at the BRDG Park at the Danforth Plant Science Center in St. Louis, creating 80 new jobs. SyMyCo is a subsidiary of Symbiotic Sciences Ltd., based in India.





Research Parks and Incubators

- **Bio-Research and Development Growth (BRDG) Park** (St. Louis) houses a variety of tenants in the bioscience industry, including Phycal LLC, Monsanto, Nidus Investment Partners, Akermis, MOgene, Novus, Allied Blending, HighQuest Partners, Global Patent Group, Conagen, Intuitive Genomics, Bioglow, as well as the biotechnician training program for St. Louis Community College's Center for Plant and Life Sciences.
- **Helix Center Biotech Incubator** (St. Louis) is a new small business incubator that provides startup companies in the plant and life science industries with affordable office and laboratory space, access to expertise, and facilities near the Donald Danforth Plant Science Center and BRDG Park. The Helix Center is scheduled for completion in 2012 with 33,000 square feet of wet and dry lab space.

- **The University of Missouri Life Sciences Business Incubator at Monsanto Place** (Columbia) supports tenants in biomedical technologies, information technology, renewable resources/green technology, and nanotechnology, as well as more traditional consumer-based businesses. The incubator was designed to establish a technology cluster in mid-Missouri.
- **Missouri Plant Science Center (MPSC)** (Mexico) is a biotechnology hub fostering collaboration between scientists and entrepreneurs for the purpose of moving research into functional, real-world business applications and consumable products. MPSC's facilities include state-of-the-art analytical and research instrumentation, shared pilot processing equipment, and a small-scale milling plant.

- **MRI Global's Research Farm** (Butler) serves as an extension of MRI's field station in Grandview, Missouri and supports expanded research in new crop technologies, farming practices, and agriculture products, with an increased focus on improved nutrition and natural products.
- **University of Missouri Discovery Ridge** (Columbia) leverages the University of Missouri's resources in agriculture, health, veterinary medicine, bioengineering, nutrition, biology, and environmental services.

Plant Science Research Centers

- **Donald Danforth Plant Science Center** (St. Louis) conducts research targeted at increasing crop yields, their nutritional value and resistance to drought and disease, reducing the need for pesticides and fertilizers and developing sustainable sources of energy.





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■ **MRIGlobal** (Kansas City), known formerly as the Midwest Research Institute, has earned international recognition for its health research services supporting the pharmaceutical, biotechnology, veterinary, and agrochemical industries worldwide. MRI develops and evaluates seed coating and pelletizing processes using chemical or biological treatments.

■ **Missouri Botanical Garden** (St. Louis) conducts the most productive and diverse botanical research in the world, employing nearly 50 Ph.D. botanists. The Garden's Herbarium is one of the world's best resources for information on bryophytes and vascular plants, with over 6 million specimens.

■ **National Center for Soybean Biotechnology (NCSB)** (Columbia) is involved in innovative molecular approaches to soybean improvement. The U.S. Congress selected the University of Missouri to host the NCSB based on their interdisciplinary research on soybean genetics, genomics, and related sciences.

The University of Missouri

The Bradford Research and Extension Center (BREC), (Columbia) a 591-acre research farm near the University of Missouri, provides land, equipment, and facilities to MU and USDA scientists for performing research in crop, soils, entomology, pathology, turf, and other disciplines.

Christopher S. Bond Life Sciences Center (Columbia) is a state-of-the-art center that promotes interdisciplinary research aimed at increasing food production and quality, improving human and animal health, and enhancing environmental quality.

■ **Delta Research Center** (Portageville) is focused on crop production and management, specifically cotton and rice production. Scientists at the 1,024-acre facility also research soybean cropping systems, weed, insect and disease control and variety evaluations. The Delta Center has gained recognition for the development of improved soybean varieties, especially those with soybean cyst nematode resistance.

■ **Plant Transformation Core** (Columbia) is a public institution for the enhancement of both basic and applied research in plant biology.

■ **The Whitney R. Harris World Ecology Center** (St. Louis) was founded almost 20 years ago by University of Missouri-St. Louis (UMSL) in cooperation with the Missouri Botanical Garden. The facility has grown into one of the world's preeminent centers for education and research in tropical biology. UMSL is one of the country's leading universities in this area of study, drawing students from 24 countries.

Other Plant Science Organizations

■ **The Botanical Society of America** (HQ St. Louis) is a membership society whose mission is to promote botany—the study of the form, function, development, diversity, reproduction, evolution, and uses of plants and their interactions within the biosphere. The Botanical Society of America relocated to St. Louis in 2003.



- **The World Agricultural Forum (WAF)** (St. Louis) is focused on sustaining the lives and livelihood of the world's population by meeting the growing needs for food, fuel, and fiber. On a global stage, the WAF produces one of the largest biennial gatherings of leaders to implement positive changes in both developed and developing nations.

Missouri Venture Capital Funds and Resources

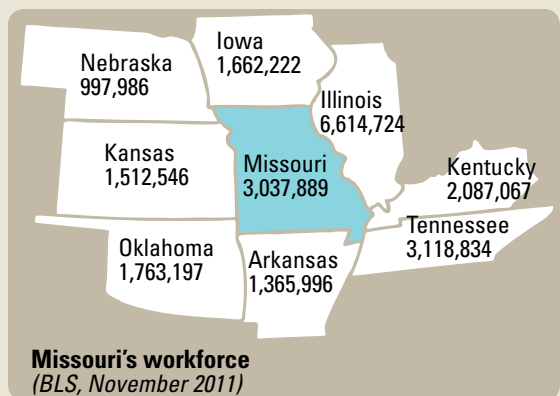
- **BioGenerator** (St. Louis) is a privately funded, not-for-profit organization that works with researchers, inventors, and entrepreneurs to build successful, sustainable life science companies. The BioGenerator provides assistance—including pre-seed and seed investments, access to no-cost shared labs and equipment, and management support—at the very earliest stages of new company formation.



- **Helix Fund** (St. Louis) supports entrepreneurship in the plant and life science sector through early stage capital and other financial support, for the purpose of advancing the commercialization of technology and innovation.
- **Nidus Partners** (St. Louis) is a unique collaboration between experienced entrepreneurs and strategic corporations for the purpose of identifying and commercializing technologies impacting the energy market. The partnership provides seed funding, entrepreneurial experience, and market input to advance early technology toward commercialization.
- **Prolog Ventures** (St. Louis) specializes in early-stage life science and animal health companies.

Angel Networks

- **Arch Angels** (St. Louis) are a part of the region's seed to later-stage equity capital continuum, targeting an investment range generally underserved by institutional venture capital firms.
- **Billiken Angels** (St. Louis) provides capital to firms in all industries and at all stages, not just start-ups. To be considered, however, a company must be owned by current or former Saint Louis University students, faculty, or staff, or by firms using intellectual property licensed from Saint Louis University.
- **Centennial Angel Network** (Columbia) is a network of accredited investors devoted to funding technology-based start-ups and early-stage companies.
- **Show-Me Angels** (Lee's Summit) is a membership organization of accredited investors committed to investing in early-stage companies in the Kansas City region.



Did you know?

Missouri is leading the way in advanced biofuels research. The Donald Danforth Plant Science Center recently received a grant from the U.S. Department of Energy to develop a system for sustainable commercialization of algal biofuel.

- **Springfield Angel Network** (Springfield) is a nonprofit corporation introducing start-up and existing entrepreneurs from southwest Missouri (although not exclusively) to individuals capable of investing financially.

State Funding Resources

- **Missouri Technology Corporation (MTC)** was established by the Missouri Legislature in 1994 as a private not-for-profit charged with promoting entrepreneurship and fostering the growth of new and emerging high-tech companies. MTC has various funding and grant programs aimed at growing the state's bioscience sector, including the Missouri IDEA (Innovation, Development, and Entrepreneurship Advancement) Funds. The IDEA Funds support the transfer of science and technology into job creation and provide financing to eligible businesses through four stages of growth: pre-seed capital-stage financing, seed capital-stage financing, venture capital-stage financing, and expansion-stage debt.

- **Life Sciences Research Trust Fund** was established in 2007 to enhance and transform research into commercial life science technology. The fund's focuses include agriculture, animal science, plant science, medical devices, biomaterials, and composite research, nanotechnology related to drug development and delivery, diagnostics, clinical imaging, and information technology related to human health.

Investment Capital Conferences

- **Ag Innovation Showcase** is the leading annual global event for agricultural technology industry leaders, entrepreneurs, venture capitalists, and investors. Held in St. Louis at the Danforth Plant Science Center, the showcase features innovative approaches for advancing productivity and sustainability in agriculture. Leading-edge technology sectors presented include: ag-biotech, food and nutrition, alternative energy, informatics, animal health, and sustainable materials.

- **InvestMidwest** facilitates investment in the region's top life science, technology, and alternative energy companies. This annual conference attracts more than 300 attendees and has helped generate \$850 million in investment capital over the past twelve years.

Workforce

- The biosciences industry in Missouri is comprised of more than 3,400 companies employing over 50,000 Missourians (*U.S. Bureau of Labor Statistics, 2011*).
- Missouri's skilled workers number more than 3 million, exceeding the entire populations of 19 other states, including Kansas, Arkansas and Nebraska.

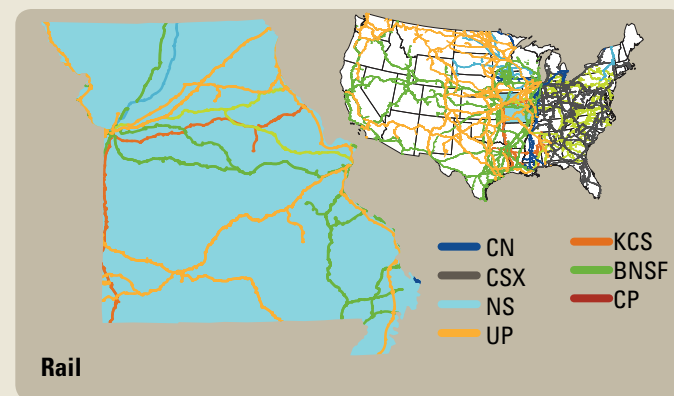
Education

- 40 Missouri colleges and universities offer bachelor's degrees or higher in Biological or Biomedical Sciences.
- 19 Missouri colleges and universities offer degrees in Agriculture.





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download map

- 86.2% of Missourians have attained a high school diploma or higher, exceeding the national average of 85%.
- Over 1.4 million Missourians hold a Bachelor's degree or higher (*U.S. Census Bureau, American Community Survey*).
- In 2010, 79,526 post-secondary degrees/certificates were awarded in the state. Of those, 39,670 were bachelor's degrees, 19,403 were master's degrees, and 4,651 were doctor's. The numbers of degrees awarded in all categories exceeds national averages.

Transportation Infrastructure

- Missouri's transportation system consistently ranks in the top ten of the U.S. (*CNBC*).
- Missouri ranks fourth in the nation for rail and highway accessibility (*Area Development, September 2010*).

Airports

- Most cities in the United States and Canada are less than three hours from Missouri by air.

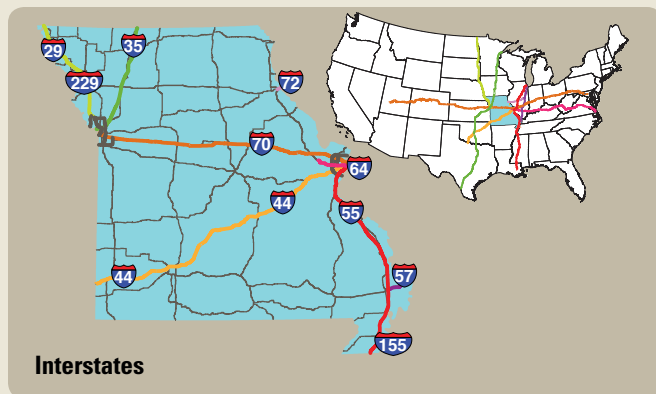
- The airport system in Missouri consists of approximately 140 public airports, two of which provide international service: Lambert-St. Louis International and Kansas City International.
- Springfield, Branson, Joplin, Columbia, Cape Girardeau, Kirksville and Waynesville (Fort Leonard Wood) also provide commercial service.

Foreign Trade Zones

- Missouri has three foreign trade zones: Kansas City, St. Louis, and Springfield.
- The FTZ at St. Louis International Airport was recently expanded to include all of St. Louis and St. Louis County.
- The KCI Intermodal BusinessCentre includes 8,000 acres of multi-use land for development on the airfield designated both FTZ and enhanced enterprise zone.

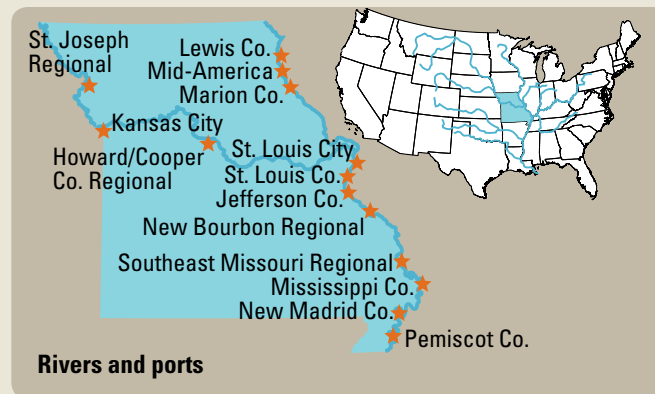
Rail

- Missouri provides efficient, low cost shipping via all class-one rail carriers: Burlington Northern Santa Fe (BNSF), Kansas City Southern (KCS), Norfolk Southern (NS), Union Pacific (UP), CSX, Canadian National Railway (CN) and Canadian Pacific (CP).
- Missouri ranks tenth in the U.S. for railroad mileage (*Bureau of Transportation Statistics*).
- Missouri is ranked fourth in tons and third in rail carloads carried by state (*Association of American Railroads*).
- The 1,340 acre CenterPoint KCS Intermodal includes an industrial park located adjacent to the Kansas City Southern Intermodal Facility. These sites are build-ready for facilities up to 1+ million square feet. KCS will offer direct rail service to CIC-KC from the deepwater Port of Lazaro Cardenas, Mexico.



Interstates

[download map](#)



Rivers and ports

[download map](#)

Roads

Missouri boasts one of the largest and least congested highway and interstate systems in the country.

- Missouri has the seventh largest highway system in the U.S. with 33,677 miles (*Reason Foundation, 2011*).
- Missouri has a total of 1,181 interstate miles, with major interstates including I-64, I-44, I-70, I-55, I-35, and I-29.
- I-70, which bisects Missouri, is 2,000 miles long and passes through 10 states. I-25 and I-35 are within the NAFTA corridor, providing easy access to Canada and Mexico.
- U.S. Hwy 71, located between Kansas City and Joplin, will become an extension of I-49 when a \$65 million upgrade is completed in 2012.
- Missouri received \$922 million in Federal highway funding in 2010 (*State Rankings, Federal Highway Administration*).

- There are more than 99,000 commercial trailers registered in Missouri.

Waterways

Located at the confluence of the two largest river systems in North America, Missouri provides efficient channels for trade and distribution.

- Missouri's 1,000 miles of navigable waterways—ranked tenth for inland waterway mileage—move an average of \$4.1 billion in cargo annually.
- Twenty-nine industrial centers, with a combined population of 90 million, can be reached from St. Louis by barge.
- St. Louis is the northernmost point on the Mississippi River that normally remains ice-free and open throughout the year. The city is also the location of the southernmost lock and dam on the Mississippi.

- Missouri has 13 public port authorities and one regional port commission (*Missouri Port Authorities*).
- Almost 2,000 acres are available for development adjacent to Missouri's port authorities.



Plant science related degrees granted in 2010

Discipline	Associate's degree	Bachelor's degree	Master's degree	Doctor's degrees	Grand total
Agriculture, General	11	87	3	0	101
Food Science and Technology	0	8	9	2	19
Plant Sciences, General	0	29	6	3	38
Agronomy and Crop Science	0	18	1	2	21
Horticultural Science	1	18	0	0	19
Biology/Biological Sciences, General	4	1,506	138	22	1,670
Chemistry	0	289	51	44	384
Chemistry, Other	0	8	0	0	8
Total	16	1,963	208	73	2,260

Source: National Center for Education Statistics, 2010

Occupations

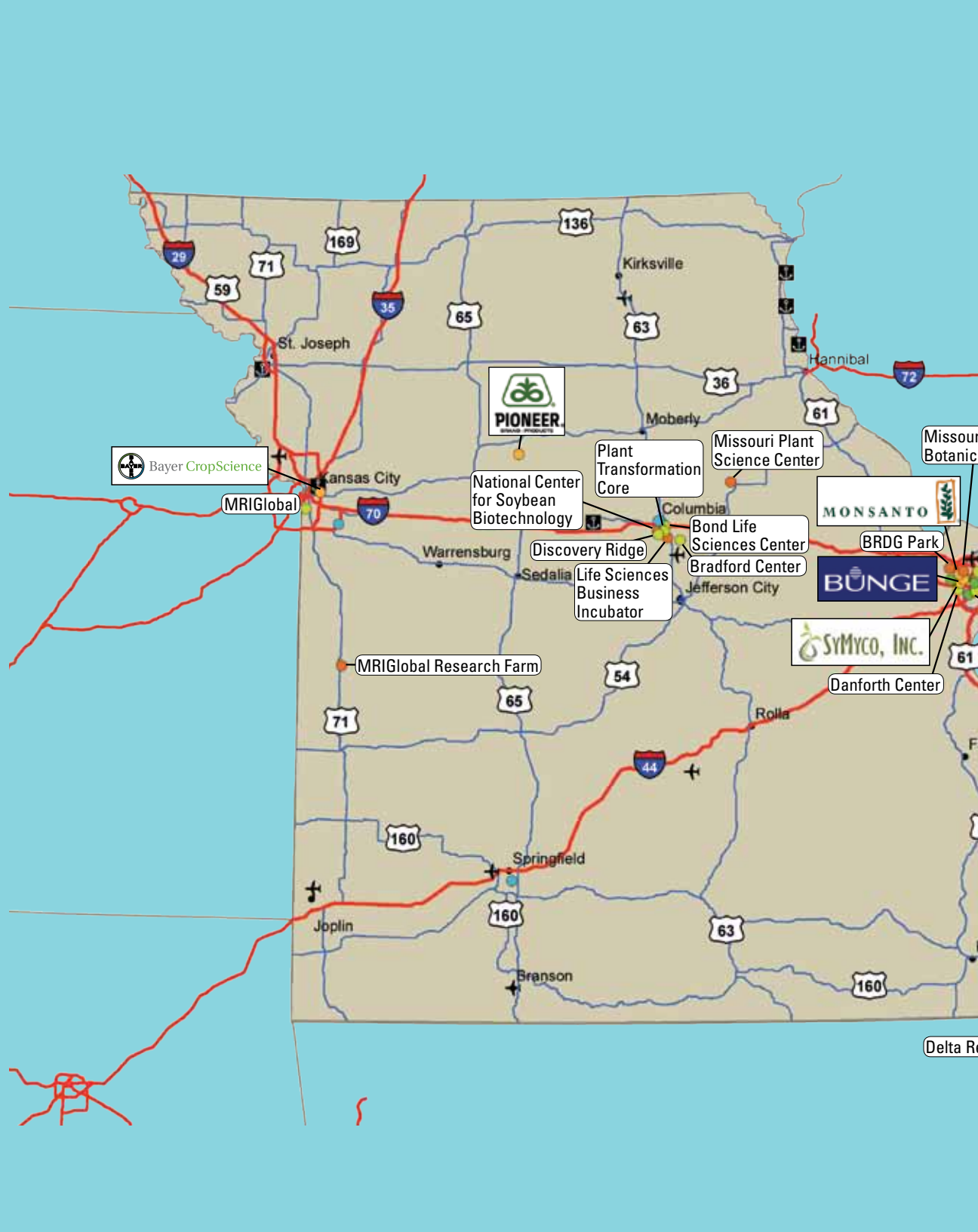
Occupation code	Occupation title	Missouri median hourly	U.S. median hourly
00-0000	All Occupations	\$14.99	\$16.57
19-0000	Life, Physical, and Social Science Occupations	\$24.46	\$28.52
19-1013	Soil and Plant Scientists	\$23.99	\$28.34
19-4099	Life, Physical, and Social Science Technicians, All Other	\$18.65	\$20.73
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	\$19.24	\$20.48
45-2011	Agricultural Inspectors	\$19.27	\$19.90
45-2091	Agricultural Equipment Operators	\$11.21	\$12.13

Source: Bureau of Labor Statistics, Occupational Employment and Wage Estimates, May 2011

Missouri's plant science industry

- Major plant science companies
- Research parks and incubators
- Biomedical research centers
- Venture capital funds
- Angel networks
- ✦ Airport
- Port

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Missouri's targeted industry clusters



Advanced manufacturing



Biosciences



Energy solutions



Financial and professional services



Health sciences and services



Information technology



Transportation and logistics

For more information, please contact:

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